

## WHAT IS CLAIMED:

1. A method for the ordered release of connections from a network entity in a signalling communications network, the connections being routed across the communications network along respective connection paths established therefor, the connection paths each traversing the network entity via network entity interfaces provided with the network entity through which said connections are routed, the method comprising the steps of:

(a) associating a priority indicator with each of the connections, the priority indicator being selected from a priority hierarchy comprised of a plurality of priority levels which varies from highest priority to lowest priority; and

(b) upon detection of a network outage which is disruptive of communications over a number of connections, releasing every connection of said number of connections which said network outage has disrupted, wherein said release takes place at the network entity in a sequence which corresponds to the priority hierarchy from the connection associated with the highest priority level to the connection associated with the lowest priority level.

2. The method according to Claim 1, wherein the step of releasing the connections comprises the steps of:

compiling an ordered release list comprising every connection of said number of connections;

releasing the connections in the ordered release list in a sequence which corresponds to the priority hierarchy from the connection associated with the highest priority level to the connection associated with the lowest priority level.

3. The method according to Claim 2, wherein the compiling of the ordered release list comprises the steps of inserting each connection of said number of connections into a table in a

location corresponding to the priority level associated with the connection such that the connections in the table are ordered in a sequence from the connection associated with the highest priority level to the connection associated with the lowest priority level.

4. The method according to Claim 3, wherein the connection path for each connection is established by a connection establishment request message corresponding to the connection, the connection establishment request message including a priority indicator, an identification of a source of the corresponding connection, and an identification of a destination of the corresponding connection.

5. The method according to Claim 4, wherein the step of releasing the connections in said release list comprises the steps of:

transmitting a release message to the source of a connection in said release list if the network outage is detected between the network entity and the destination of the connection; and  
transmitting a release message to the destination of a connection in said release list if the network outage is detected between the network entity and the source of the connection.

6. The method according to Claim 5, wherein the priority indicators are associated with their respective connections in a look up table in a memory in the network entity.

7. The method according to Claim 6, wherein the network outage is the failure of a signalling link corresponding to said number of connections, said signalling link being for communicating, administrative information concerning operation of said number of connections.

8. The method according to Claim 6, wherein the network outage is the failure of a network entity interface carrying said number of connections.

9. The method according to any one of Claims 7 and 8, wherein the signalling communications network is an ATM communications network.

10. The method according to Claim 9, wherein each connection is associated with a traffic rate, and connections associated with a common level of priority are listed in the release list in a sequence corresponding to the traffic rates of the connections.

11. The method according to Claim 10, wherein connections in the release list associated with a common level of priority are ordered in sequence from the connection having the lowest traffic rate to the connection having the highest traffic rate.

12. A method for the ordered release of a subset of connections of a number of connections provided on a single logical trunk linking a first network entity and a second network entity, the logical trunk having a variable capacity, the method comprising the steps of:

(a) associating a priority indicator and a traffic rate with each of the connections, the priority indicator being selected from a priority hierarchy comprised of a plurality of priority levels which varies from highest priority to lowest priority;

(b) upon detection of a reduction of the capacity of the logical trunk, selecting from said number of connections a group of connections to be released; and

(c) following said selection of connections to be released, releasing every connection of said group of connections in a sequence which corresponds to the priority hierarchy from the highest priority level to the lowest priority level.

13. The method according to Claim 12, wherein the selecting of a group of connections comprises the further steps of:

selecting connections for release from said number of connections in a sequence beginning with the connection associated with the lowest priority level, until the aggregate of the traffic rates of selected connections is greater than or equal to the difference between the capacity of the logical trunk and the aggregate of the traffic rates of said number of connections; and  
compiling an ordered release list enumerating each connection selected for release.

14. The method according to Claim 13, wherein the step of compiling the ordered release list comprises the step of inserting each connection selected for release into a table in a location corresponding to the priority level associated with the connection such that the connections in the table are ordered in a sequence from the connection associated with the highest priority level to the connection associated with the lowest priority level.

15. The method according to Claim 14, wherein the connection path for each connection is established by a connection establishment request message corresponding to the connection, the connection establishment request message including priority level information, traffic rate information, and information identifying a source and a destination of the corresponding connection.

16. The method according to Claim 15, wherein the step of releasing the connections in said release list comprises the step of transmitting a release message to the source of a connection in said release list.

17. The method according to Claim 16, wherein the logical trunk comprises a plurality of physical links.

18. The method according to Claim 17, wherein the signalling communications network is an ATM communications network.

19. The method according to Claim 18, wherein the logical trunk is an IMA trunk.

20. The method according to Claim 19, wherein the priority indicators and traffic rates are associated with their respective connections in a look-up table in a memory in the first network entity.

21. The method according to Claim 14, wherein connections associated with a common level of priority are listed in the release list in a sequence corresponding to the traffic rates of the connections.

22. The method according to Claim 14, wherein connections in the release list associated with a common level of priority are ordered in sequence from the connection having the lowest traffic rate to the connection having the highest traffic rate.

23. An apparatus for the ordered release of connections in a signalling communications network, the connections being routed across a network entity in the communications network along respective connection paths therefor, the connection paths each traversing the network entity via network entity interfaces provided with the network entity and through which said connections are routed, the apparatus comprising:

(a) means for storing a priority indicator associated with each of the connections, the priority indicator being selected from a priority hierarchy which varies from highest priority to lowest priority;

(b) means for directing the release of every connection of a number of connections in the event that a network outage which is disruptive of communications over said number of connections is indicated to the apparatus, said release of said number of connections being directed in a sequence corresponding to the priority hierarchy from the connection associated in

the storing means with the highest priority level to the connection associated in the storing means with the lowest priority level.

24. The apparatus according to Claim 23, wherein the storing means is a memory.

25. The apparatus according to Claim 24, wherein the memory comprises a look-up table and each connection is stored with a priority indicator in the look-up table.

26. The apparatus according to Claim 25, wherein the directing means comprises means for compiling an ordered release list in the memory upon indication of the network outage to the apparatus, the compiling means enumerating in the ordered release list every connection of said number of connections in order from the connection associated with the highest priority level to the connection associated with the lowest priority level.

27. The apparatus according to Claim 26, wherein each connection is established by a corresponding connection establishment request message received by the network entity, the connection establishment request message including a priority indicator, an identification of a source of the corresponding connection, and an identification of a destination of the corresponding connection, wherein the priority indicator for each connection is obtained by the apparatus from the corresponding connection establishment request message through the connecting means.

28. The apparatus according to Claim 27, wherein the directing means comprises a means for transmitting release messages over said signalling links, and wherein the transmitting means releases each connection by:

transmitting a release message to the source of a connection in said release list if the network outage is detected between the network entity and the destination of the connection; and

transmitting a release message to the destination of a connection in said release list if the network outage is detected between the network entity and the source of the connection.

29. The apparatus according to Claim 28, wherein the network outage is a failure of a signalling link corresponding to said number of connections, said signalling link being for communicating administrative information concerning operation of said number of connections.

30. The apparatus according to Claim 28, wherein the network outage is the failure of an access link carrying said number of connections.

31. The apparatus according to any one of Claims 29 and 30, wherein the signalling communications network is an ATM communications network.

32. The apparatus according to Claim 32, wherein each connection is associated in said look-up table with a traffic rate, and the compiling means lists connections associated with a common level of priority in the release list in a sequence corresponding to the traffic rates of the connections.

33. The apparatus according to Claim 32, wherein the compiling means enumerates connections associated with a common level of priority in the release list in sequence from the connection having the lowest traffic rate to the connection having the highest traffic rate.

34. An apparatus for the ordered release of connections carried on a logical trunk having a variable capacity, the logical trunk being provided in a connection-oriented communications network between a first network entity and a second network entity and carrying a number of connections, the apparatus comprising:

(a) means for storing a priority indicator and a traffic rate associated with each of the connections of said number of connections, the priority indicator being selected from a priority hierarchy which varies from highest priority to lowest priority;

(b) means for selecting from said number of connections a group of connections to be released upon a reduction of the capacity of the logical trunk; and

(c) means for directing the release of every connection of said group of connections in a sequence which corresponds to the priority hierarchy from the connection of the group associated with the highest priority level to the connection of the group associated with the lowest priority level.

35. The apparatus according to Claim 34, wherein the storing means is a memory.

36. The apparatus according to Claim 35, wherein the memory comprises a look-up table and each connection is stored with a priority indicator and with a traffic rate in the look-up table.

37. The apparatus according to Claim 36, wherein the selecting means selects connections for release from said number of connections in a sequence beginning with the connection associated with the lowest priority level, until the aggregate of the traffic rates of selected connections is greater than or equal to the difference between the capacity of the logical trunk and the aggregate of the traffic rates of said number of connections.

38. The apparatus according to Claim 37, wherein the selecting means comprises a means for compiling an ordered release list in the memory enumerating each connection of said group of connections in a sequence which corresponds to the priority hierarchy from the connection of the group associated with the highest priority level to the connection of the group associated with the lowest priority level.



39. The apparatus according to Claim 38, wherein each connection is established by a connection establishment request message, the connection establishment request message including a priority indicator, traffic rate information, an identification of a source of the corresponding connection, and an identification of a destination of the corresponding connection, wherein the priority indicator and traffic rate for each connection is obtained by the apparatus from the corresponding connection establishment request message through the connecting means.

40. The apparatus according to Claim 39, wherein the directing means comprises a means for transmitting release messages, and wherein the transmitting means releases each connection in said release list by transmitting a release message to the source of a connection in said release list.

41. The apparatus according to Claim 40, wherein the logical trunk comprises a plurality of physical links.

42. The apparatus according to Claim 41, wherein the connection-oriented communications network is an ATM communications network.

43. The apparatus according to Claim 42, wherein the logical trunk is an IMA trunk.

44. The apparatus according to Claim 43, wherein the compiling means enumerates connections associated with a common level of priority in the release list in a sequence corresponding to the traffic rates of the connections.

45. The apparatus according to Claim 44, wherein the controller enumerates connections associated with a common level of priority in the release list in a sequence from the connection having the lowest traffic rate to the connection having the highest traffic rate.

